

REMARKS

General Remarks and Status of the Claims

Applicants thank the Examiner for her examination of this application and allowance of pending claims 18-20, 22-24, 29-31 and 33-34. To further the prosecution of the application, Applicants hereby cancel claims 1-12, 14-17, 21, 25-28, 31-32 and 34 without prejudice or disclaimer. Claim 30 has been amended. Claims 35-50 are newly presented. Therefore, upon entry of the present Amendment, claims 18-20, 22-24, 29-30, 33 and 35-50 are pending in the present application. Applicants request consideration of this Response and new claims, and an early and favorable reply is earnestly solicited. No new matter is being added by the present amendment.

Independent claims 1, 9, 15 and 21, inter alia, were rejected in the Office Action mailed on September 10, 2003, under 35 U.S.C. § 103(a) as unpatentable over what the Office Action calls "Applicant Admitted Prior Art (AAPA)" in view of Chen et al. (US Pat. 6,423,949). In light of the cancellation of said claims and presentation of the new claims, the rejection is moot. Applicants nonetheless address the cited art below, and discuss reasons for allowing the presently pending claims over the cited art.

The Chen Reference

The Chen reference is directed to temperature control of a process in a process chamber 145, specifically a chemical vapor deposition ("CVD") reaction chamber susceptor 155, used to treat semiconductor wafers during a CVD process. (Generally, Chen, cols. 3 – 6). Chen desires to solve a problem of uneven heating of wafers that occurs in single zone heating of CVD chambers by including two heaters that cover separate zones in the susceptor. The reference discloses:

a heating apparatus suitable for supporting a single-wafer (e.g., a semiconductor wafer) on a stage or susceptor in a reaction chamber. The heating apparatus includes at least two heating elements to maintain a uniform reaction temperature of the surface of the susceptor (and of a wafer on a susceptor). In one embodiment, each heating element lies in a distinct plane in the susceptor of the heater. (Chen, col. 5, lines 61 – 67).

Chen controls the power delivered to each of the heaters individually to control the temperature distribution on the surface of the susceptor. With reference to Figures 8 and 9 in Chen, one heater 250 is placed in an inner area 245 of the susceptor 155 and another heater 260 is placed in an outer area 255 of the susceptor 155. Chen controls the heating by providing special resistive heaters in the susceptor that have spatially non-uniform resistances, and hence non-uniform heat generation properties, along their extents (Chen, col. 11, lines 36-40). The heaters are energized with controlled voltages to vary the power to the heaters during the CVD process. Chen describes this concept as follows:

The dual zone heater temperature uniformity is controlled by voltage ratio or power ratio between the inner and outer zones. The ratio is not a constant, but needs to be changed as the temperature changes. (Chen, col. 16, lines 39 – 43).

Column 17 et seq. of Chen describe the control modes used to deliver variable voltage and power to the heaters 250 and 260, including a Ramp Control mode (Chen, col. 17, line 28) and a Proportional Plus Integral Derivative Forward (PIDF) mode (Chen, col. 16, line 33, col. 18, line 62).

Chen does not teach or suggest selectably or alternately placing the heaters in more than one electrical configuration, e.g., a series then a parallel electrical configuration. In fact, by using an individual voltage control technique for varying the power to the heaters (Id.), Chen teaches away from placing the outer and inner zone heaters 250 and 260 in a parallel configuration, which uses a common voltage. Likewise, Chen's heater elements 250 and 260 (see, Chen, Fig. 13) are not disclosed to share a common current or be placed in a series configuration, since they are individually controlled. Furthermore, Chen lacks any teaching or suggestion of a switching element that selectably energizes, de-energizes, or configures the two heaters in different configurations.

Combining Johnston and AAPA-Chen is Improper

The combination of Johnston (US Pat. 4,176,557) and AAPA-Chen (see Office Action paragraph 2) is improper. To use the parallel resistors 42 (misabeled 44) and 108 (Johnston, Fig. 9) would defeat the heater control of Chen, which calls for systematic variation of the voltage or power ratio of the two heater elements. By being connected in parallel, Johnston's resistors 42 and 108 cannot be provided with individual voltage control. Furthermore,

Johnston's resistors 42 and 108 are not coupled to a shell, but are located at different locations in a pressure sensor 10 (see, Johnston, Fig. 1).

Applicants' Pending Claims Distinguish Over the Cited Art

Chen does not selectively or temporally reconfigure or switch the heaters to provide different resistances, but rather varies and controls a voltage to the two resistive heaters 250 and 260, which provide a static resistance, and which are not selectably configurable to provide different resistances.

AAPA lacks more than one heating element coupled to the shell, and further lacks any configuration of heating elements to provide different resistances.

Regarding Applicants' claim 35, AAPA and Chen lack the recited method for heating a pressure transducer using resistive heating elements coupled to a shell, including "(B) during a first time interval, connecting the one or more electronic components to a first configuration of the first and second resistive heating elements, the first configuration providing a first electrical resistance; and (C) during a second time interval, connecting the one or more electronic components to a second configuration of the first and second resistive heating elements, the second configuration providing a second electrical resistance, the second electrical resistance being different from the first electrical resistance." As stated above, Chen retains the heaters in their given configuration and varies the voltage supplied to the heaters to control the heating.

Therefore, independent claim 35 patentably distinguishes over AAPA and Chen and should be allowed. Dependent claims 36-43 depend from claim 35 and should be allowed for at least the same reasons provided with respect to claim 35, above.

Similar arguments apply to Applicants' independent claim 44. AAPA and Chen lack a method for heating a pressure transducer using different configurations of the first and second resistive heating elements. As stated above, Chen retains the heaters in their given configuration and varies the voltage supplied to the heaters to control the heating.

Therefore, independent claim 44 patentably distinguishes over AAPA and Chen and should be allowed. Dependent claims 45-50 depend from claim 44 and should be allowed for at least the same reasons provided with respect to claim 44.

Furthermore, contrary to the assertion of the Office Action that "Chen et al. teaches a heating apparatus comprising a pressure indicator (145) that has at least two elements" (Office

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Action, p. 2), Chen's cited element 145 is a reaction chamber and not a pressure indicator.

"FIG.1, FIG. 2 and FIG. 3 show chamber body 100 that defines reaction chamber 145 where a reaction between a process gas or gases and the wafer takes place." (Chen, col. 6, lines 26 – 28).

While Chen mentions a pressure indicator elsewhere in the patent "controller 225 may further be coupled to a pressure indicator that measures the pressure in chamber 145" (Chen, col. 16, lines 6 – 8), the heaters of Chen are designed and arranged to heat the process chamber and wafer, and *not* the pressure indicator or a shell thereof.

For at least the reasons stated above, Applicants believe that all pending claims distinguish over the art of record, whether taken individually or in combination, and that the claims are in allowable condition. Accordingly, Applicants respectfully request allowance of all pending claims in this application.

Applicants hereby request that the period for responding to the outstanding Office Action be extended for two months' time. The Commissioner is hereby authorized to charge the required fee of \$420.00 for filing the request for extension of time to our Deposit Account No. 08-0219.

No other fees are believed to be due with this response. However, please charge any additional fees or credit any overpayments to Deposit Account No. 08-0219. Applicants' representatives may be reached at the number provided below with regard to any matter arising in this case.

Respectfully submitted,

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